THIRD ANNUAL REPORT

Advisory Committee on Heavy Oil and Oil Sands Development

1986

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Alberta
ENERGY

Alberta
ENERGY AND NATURAL RESOURCES

Office of the Minister

Legislature Building, Edmonton, Alberta, Canada T5K 2B6 403/427-3740

October 31, 1986

To Her Honor
Helen Hunley
Lieutenant-Governor
Province of Alberta

Madam:

I have the honor to transmit the Third Annual Report of the Advisory Committee on Heavy Oil and Oil Sands Development.

Respectfully submitted

Neil Webber

Neil Webber
Minister of Energy

LEGISLATIVE ASSEMBLY
ALBERTA

October 31, 1986

To The Honorable Neil Webber
Minister of Energy

Sir:

I have the honor to transmit the Third Annual Report of the Advisory Committee on Heavy Oil and Oil Sands Development.

Respectfully submitted

Bill Payne

W. E. (Bill) Payne, MLA
Chairman

Statements of the Former and Present Chairmen

It was an honor and a privilege for me to have served as chairman of the Advisory Committee on Heavy Oil and Oil Sands Development from its inception in June 1983 until my retirement from the Legislative Assembly of Alberta in May 1986. As my constituency of Lloydminster was directly affected by the development of our heavy oil and oil sand resources, the need for such an advisory committee was readily apparent to me and I was pleased to accept its chairmanship.

The role assigned to the advisory committee is an important one. The committee has experienced a great deal of success in fostering better communications among industry, communities and regulatory agencies and departments. Concrete results of the willingness expressed to the committee by industry and the municipalities to discuss issues and concerns and negotiate agreeable solutions are becoming apparent throughout the areas affected by development. I also commend the government departments which reacted promptly in so many instances to our comments and recommendations.

Finally, I would thank my fellow committee members for the co-operation and assistance I received while serving as chairman. I very much enjoyed our times together and wish you and your new chairman, Mr. Bill Payne, every success in your future endeavors.

J. E. (Bud) Miller

As incoming Advisory Committee chairman, I would like to acknowledge Bud Miller's leadership during the formative years of the committee. In the years ahead I hope to emulate his leadership qualities and directions. In particular, I would hope that the committee will build on Mr. Miller's efforts to facilitate communication among the private and public sector participants in heavy oil and oil sands development.

Bill Payne, MLA
Chairman

Role of the Committee

The Advisory Committee on Heavy Oil and Oil Sands Development was established by the Department of Energy and Natural Resources Amendment Act, 1983 and re-confirmed by the Department of Energy Act, 1986. The first meeting was held on July 4, 1983.

The Advisory Committee was formed in recognition of the impact on communities by intense and accelerated growth due to heavy oil and oil sands development. It monitors such growth and anticipates problems.

It advises the Government of Alberta on the need for and scheduling of implementation of government programs providing public services and facilities in areas of the province affected by the development of heavy oil or oil sands resouces. Such recommendations will be in keeping with the pace and scale of resource development.

The Advisory Committee provides a continuing liaison between the Government of Alberta and the communities that are or may be affected by the anticipated development of heavy oil or oil sands resources in the vicinity of those communities. The committee hears and reviews the concerns of residents about the possible effects of development on their communities and brings these concerns and suggestions to the attention of the government.

In general, it encourages and facilitates continuing communications among the organizations engaging in the business of the development of heavy oil and oil sands resources, the residents of communities of Alberta directly affected by that development, and the various provincial government departments and agencies concerned with the regulation of that development.

Committee Membership

The legislation which established the Advisory Committee on Heavy Oil and Oil Sands Development also prescribes its membership to ensure balanced representation.

The chairman is a Member of the Legislative Assembly of Alberta and the vice-chairman is a representative of the provincial government departments concerned with the management of the resource.

Three members are appointed to represent residents of heavy oil and oil sands areas. The industry and the Energy Resources Conservation Board are also represented.

W. E. (Bill) Payne Chairman
M.L.A.

R. G. (Ralph) Evans
Energy Resources Conservation Board

Les Cooke Vice-Chairman
Alberta Foresty, Lands & Wildlife

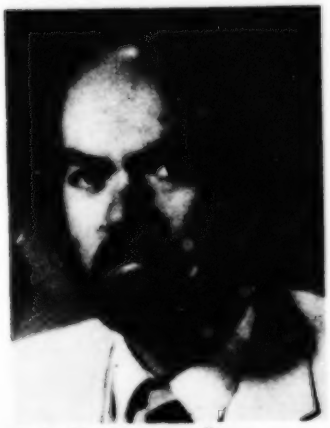
D. H. (Don) McGladdery
Fort McMurray

These individuals bring to the committee's work a great deal of experience, expertise and insight pertinent to the technology and socio-economic impacts of heavy oil and oil sands resource development in Alberta.

N. W. (Neil) Gilliat
Slave Lake

R. S. (Dick) Aberg
Industry

Wm. (Bill) Slawuta
Bonnyville



R. L. (Lanny) Coulson
Executive Director

Resources and Development

Industry activity and developments in the heavy oil and oil sands areas continued to be brisk during late 1985 and early 1986 but declined sharply for the remainder of 1986. Six commercial crude bitumen in situ recovery schemes received approval from the Energy Resources Conservation Board (ERCB) in this period, but by mid-1986 most of these schemes were either on hold or shelved due to declining economic conditions, with low crude bitumen selling prices the main obstacle.

In late 1985, Murphy Oil received approval to develop, in four phases, a 1 600 m^3/d (cubic metres per day) steam stimulation project in the Lindbergh area Murphy had been developing cyclic steam stimulation recovery expertise in the area since 1954. Murphy completed most of its plant construction but has delayed drilling and production operations.

Dome Petroleum received approval for two 4 000 m^3/d commercial in situ recovery schemes using steam cycling. The first project was to recover crude bitumen resources from 101.5 sections of land in the Lindbergh area. It included existing and additional primary production operations (415 wells) and expansion of the existing experimental enhanced crude bitumen recovery operations to commercial scale.

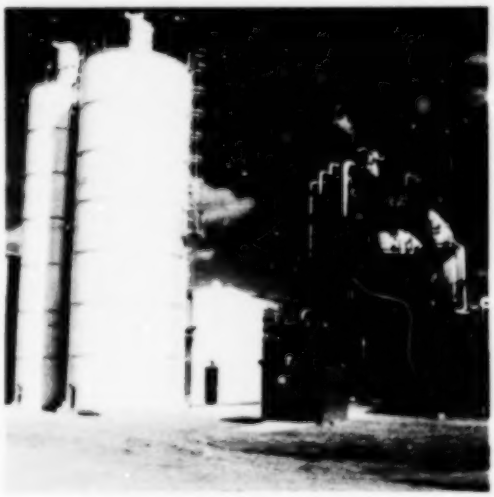
Dome's second project involved the development of steam injection operations on 20 sections of land on the Primrose Weapons Range. It would be developed using a staged growth concept. Beginning in 1986 and in each year of the first five-year period, a "stage" composed of a four-section block of land would be started. The total project crude bitumen production capacity of 4 000 m^3/d would be achieved in 1991 with five stages on stream. In early 1986 Dome shelved the Primrose project and shut-in the experimental operations in the same area. Their Lindbergh project was also placed on hold.

Suncor Inc. was granted approval for the production of 1 000 m^3/d of crude bitumen from stage one of a four-stage project, called the Burnt Lake project and also located in the Primrose Air Weapons Range. Stage one would initially require the drilling of 110 wells to be cyclicly steamed. Up to 360 additional wells would be required over the life of the stage in order to maintain the 1 000 m^3/d level of productivity. Approximately 2 000 wells would be required over the life of the entire four-stage project, and production would ultimately reach a level of 4 000 m^3/d. Suncor shelved the ($105 million) Burnt Lake project and decided against starting any further heavy oil projects at this time, although its Fort McMurray mining scheme and the Fort Kent experimental in situ project continue in production.

In mid-1986 Esso Resources received approval for phases seven to 10 of its Cold Lake Production Project. An additional 6 000 m^3/d of bitumen production would be developed from 14.25 sections of land located adjacent to the existing six phases. Esso announced, however, that it would delay construction activities for at least a year.

PanCanadian Petroleum also received approval in 1986 for phase one of a three-phase commercial project to be located near Elk Point. Phase one would produce 500 m^3/d and incorporate 113 existing wells, with another 165 wells to be drilled over the next 20 years. While some construction and drilling activity may proceed in the near future the major capital expenditures and construction activities for thermal recovery will not begin until 1989.

Construction and drilling at Shell Canada's Peace River project were completed and operations commenced in October 1986. The $200 million, 212-well project is designed for a crude bitumen production rate of some 1 600 m^3/d.

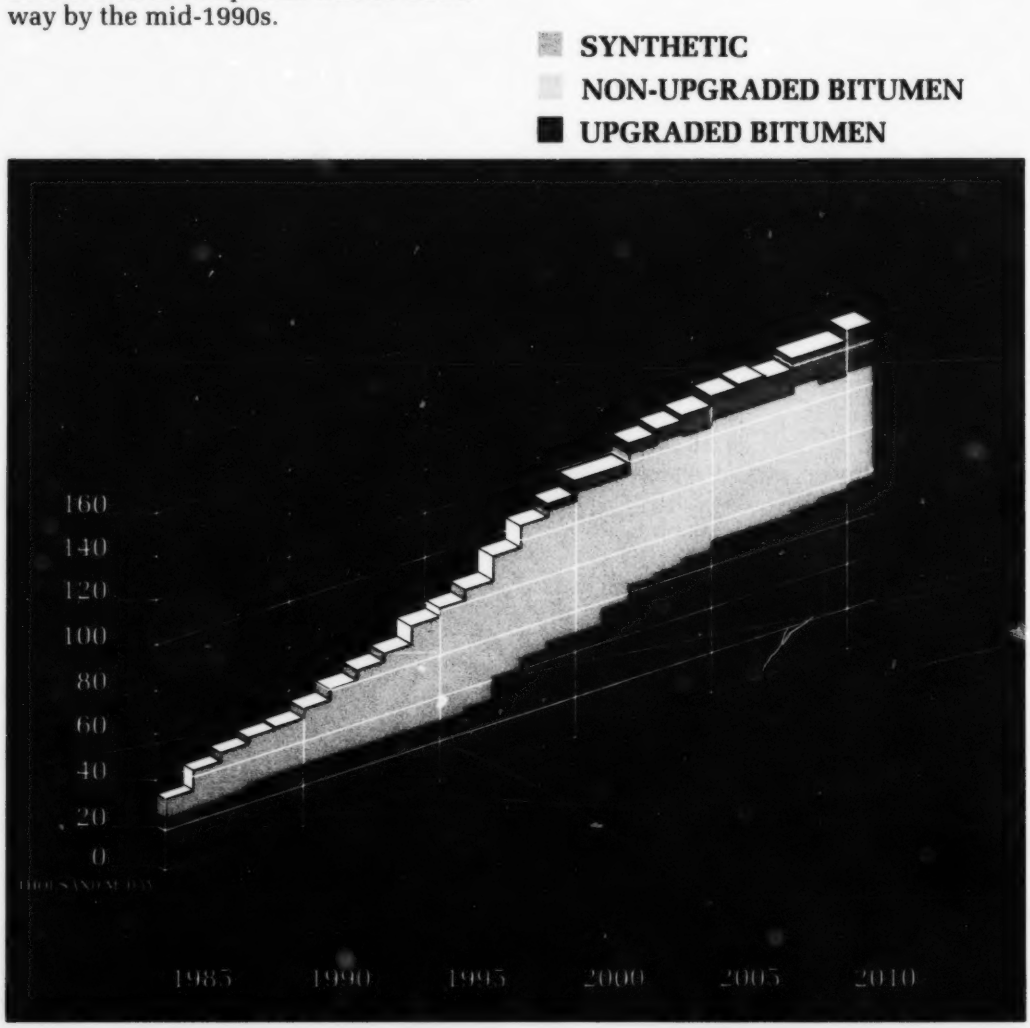


BP Canada/Petro-Canada have applied to recover up to 2 000 m^3/d of bitumen from the Cold Lake Clearwater Oil Sands Deposit by a three-phase expansion of the existing 1 100 m^3/d Wolf Lake experimental project. The expanded project would initially require drilling of 336 wells with an additional 48 to 64 wells drilled annually thereafter to sustain the planned productivity. BP Canada has indicated, however, that it may not proceed until crude bitumen prices improve substantially and show considerable stability.

Developments still on the drawing board and under review by the ERCB include Amoco Canada's proposal for its Elk Point steam injection project. It would add some 14 sections, expand the production capacity from 640 m^3/d to 1 280 m^3/d and reduce the well spacing from 16 ha to 4 ha per well in two sections of the commercial project.

ERCB Oil Sands Production Forecast 1985-2010

The ERCB's forecast of the production of Alberta's crude bitumen and synthetic crude oil is shown in this figure. The decline in Alberta's production of conventional crude oil is expected to be offset by production of crude bitumen and synthetic crude oil from oil sands areas. While the timing of new developments in the oil sands areas is uncertain because of recent oil price reductions, the ERCB expects that accelerated development will be under way by the mid-1990s.



Alberta Oil Sands/Heavy Oil Areas – Active Projects

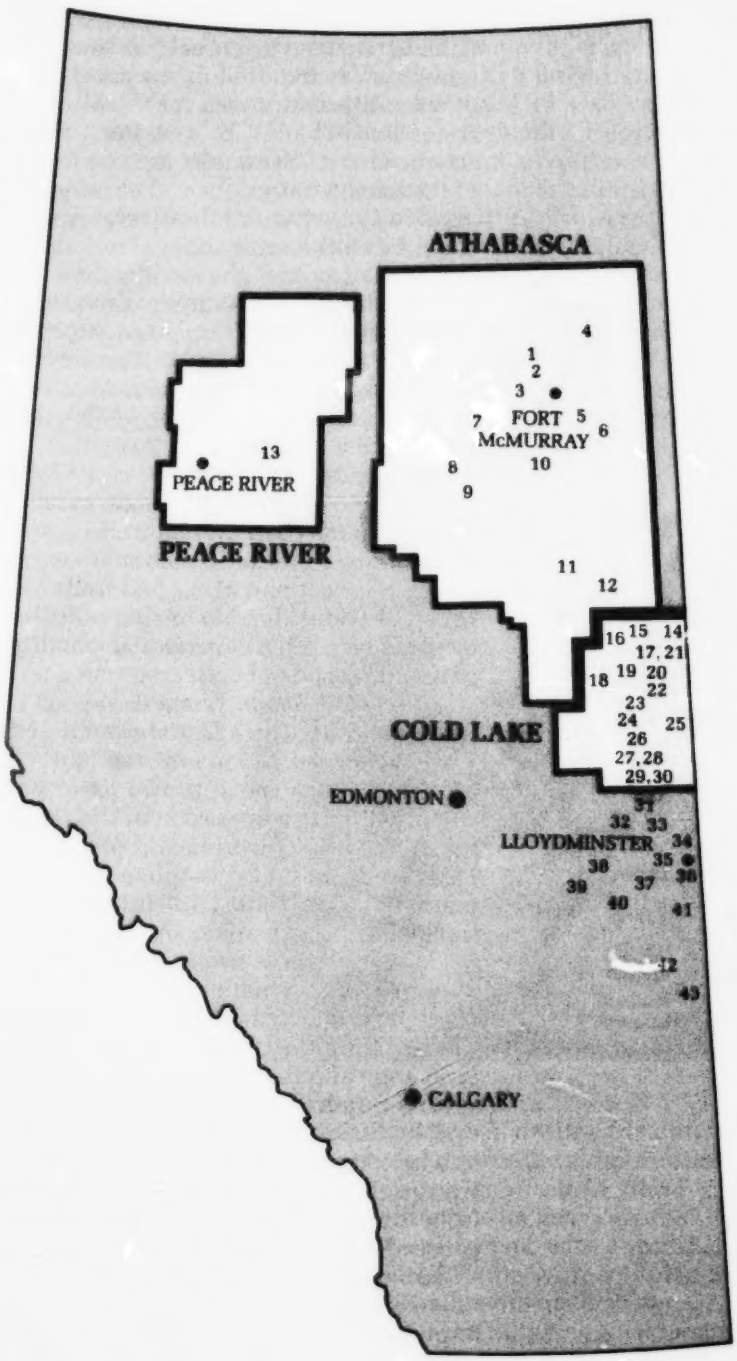
PROJECTS

Athabasca
1. Syncrude
2. Suncor
3. AOSTRA
4. Canterra
5. Texaco
6. Amoco
7. Unocal
8. Gulf
9. Amoco
10. Petro Can
11. Petro Can
12. AEC

Peace River
13. Shell

Cold Lake
14. Suncor
15. Dome
16. B.P.
17. Esso (4)
18. Canoxy
19. Husky
20. Amerada
21. Bow Valley
22. Drummond
23. Koch
24. Suncor
25. Amoco
26. Murphy
27. Amoco
28. Pan Canadian
29. Westmin
30. Dome

Heavy Oil
31. Husky
32. Canoxy
33. Murphy
34. Home
35. Mobil
36. Mobil
37. ORS
38. Dome
39. Petro Can
40. Koch
41. Dome
42. Dome
43. Norcen



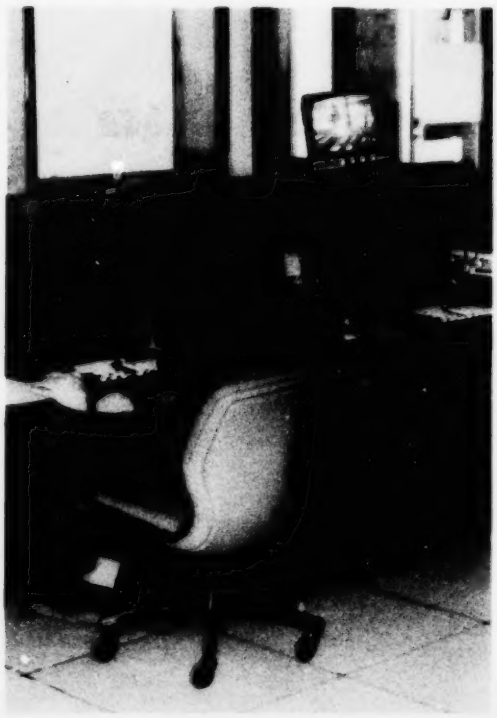
In the Fort McMurray area, Syncrude Canada received approval for new mining areas required in support of new facilities approved for the Mildred Lake Plant. The ERCB, with the concurrence of Syncrude, representatives of the local community and closely involved government departments, considered the mine extension application in two phases. The first phase, which dealt with areas required to meet 1987 production goals, received approval in February 1986. The second phase, which dealt with areas required to meet planned production goals between the years 2000 to 2013, recently received approval.

Syncrude is testing a dredging and hydraulic transport system in the overburden material immediately west of the tailings pond at the Mildred Lake site. Considerable testing is still required before the commercial viability of this project can be ascertained.

Alberta Oil Sands Technology and Research Authority's Underground Test Facility, located 45 km north of Fort McMurray, received approval for construction and operation of the remaining mine, drilling and process facilities required to complete the planned experiment. This unique test includes two large diameter shafts and 2 500 m of interconnecting tunnels in the limestone formation underlying the oil sands. Eight well pairs angling upward from the tunnels into the oil sand zone and then horizontally for several hundred metres, would be drilled. Steam would be injected into one horizontal well of each pair, and warmed bitumen would be produced from the other. The project is proceeding.

Shell Canada, in association with Solv-Ex Corporation, announced plans to proceed with a $260 million experimental oil sands mining and extraction project designed to produce 7 500 barrels of bitumen per day. Phase one of the project involved the transportation of 1 500 tonnes of oil sand from Shell's Athabasca lease to a Solv-Ex extraction test plant in Albuquerque, New Mexico. Pending successful results of testing and acceptable economic forecasts, Shell would proceed with phase two and plant construction in 1988.

Other experimental activity continued during the subject period. Eleven schemes were approved in the heavy oil and oil sand areas (four heavy oil and seven oil sands) while five schemes were terminated or suspended. Ten of the new schemes are steam stimulation applications and one is to evaluate an electrical stimulation test.



Committee Activity and Operations

During its first year of operation, the Advisory Committee devoted much of its time and effort to gaining knowledge of the technology of heavy oil recovery and an appreciation of development from the community point of view. Meetings were held with communities, operators and various public interest groups. In its second year, while these activities continued, considerable effort was directed at communicating to the various government departments the concerns and issues identified by the municipalities and industry.

In this third year, these activities again continued but the Advisory Committee determined also to provide a forum in which the three major groups of industry, government and local municipalities could meet and interact. While many individual meetings had been held, it was felt that this format would provide a new and innovative technique for the exchange of information among the sectors. The Cold Lake Oil Sands Area was chosen for this exercise because growth pressures have been severe there and a large number of municipalities and operators are involved.

The main purpose of these information exchange workshops was to establish the basis for a closer on-going relationship between industry and the municipalities based on an informed understanding of their mutual needs. A secondary objective was to increase the awareness of the municipalities of both the short- and long-term implications of heavy oil and oil sands development. Two workshops were held during the year. The first, in Elk Point in November, focused on the concerns of the rural municipalities — the counties, municipal district and improvement district. The second, in GrandCentre in September, emphasized the concerns of the towns and villages in the Cold Lake Oil Sands Area.

At each workshop, the participants were divided into smaller groups with representation from government, industry and the local municipalities in each group. Opportunities were provided for each group to identify concerns and issues related to the development of the oil sands deposit and to develop recommendations to improve the situation. As a follow-up, summary reports of the workshop results were prepared and forwarded to all concerned for their further consideration.

The Advisory Committee was pleased to note that, despite the current economic downturn, the communities and the industry continue to view potential growth from heavy oil and oil sands development with enthusiasm and look to the future with confidence. The willingness, evidenced at the workshops, for the industry, government

and the municipalities to work together to resolve problems is applauded. The overall response to the workshop format was positive and representatives of all three groups have requested that the Advisory Committee continue to sponsor this type of meeting on a regular basis. This is being actively considered.

In addition to these major workshops, the Advisory Committee continued to meet, either collectively or on an individual basis, with industry representatives, government agencies and communities. Members continued to attend hearings and public meetings within their respective areas in order to report on the concerns of interest groups, associations and organizations. Group meetings were held with senior officials from the Alberta Departments of Municipal Affairs, Housing, Native Affairs and Transportation.

Transportation Concerns

Roads continue to be a frequent concern raised to the Advisory Committee in areas experiencing heavy oil development. The number of concerns relative to roads is fairly complex including road construction, road maintenance, road safety and truck routes. As in the past, the prompt co-operation of Alberta Transportation in responding to concerns is acknowledged. Particularly welcome was the financial commitment of the provincial government in April to a new "Local Road Resource Program". This special grant program was designed to assist municipalities to upgrade local roads that carry heavy resource and industrial traffic.

The Advisory Committee continues to support consideration of an aggressive "roads to resources" program which would provide adequate road

access for exploration and development throughout the northern part of the province. Relative to this, the recent creation of an ad hoc Steering Committee on Northern Road Development is commended. This committee, with representation from senior levels of Alberta Transportation, Alberta Municipal Affairs, Alberta Forestry, Lands and Wildlife and the Northern Alberta Development Council, has been given the mandate to investigate the integration of road, resource and settlement planning.

Employment and Training Concerns

A new initiative on the part of the Advisory Committee this year was to visit native and Metis communities to ascertain their perceptions on problems related to heavy oil and oil sands development. Only four communities have been visited to date and the Advisory Committee intends to visit other reserves and settlements in the future. The main issues identified to date relate to employment and training. The Advisory Committee is pleased to see a continued willingness on the part of industry to employ local Albertans, including natives, either directly or by contract. Many companies have divided a major development project into a number of small contract projects on which small local, often native, companies can successfully bid. The Advisory Committee encourages industry to continue this successful practice.

Financial Concerns

Fiscal pressures on communities continue to be an issue in areas experiencing heavy oil and oil sands development. There are two main aspects to this concern. Firstly, there are usually excessive financial demands in the early stages of project development where a municipality has to supply services and infrastructure to a rapidly expanding population. Secondly, the projects with their taxation base are often located outside the municipality being influenced by the increased demand for roads, housing, sanitation and solid waste disposal, water and social services.

In response to these concerns, many municipalities have suggested that the province needs to be innovative in providing "up front" funding for infrastructure and services. While provisions exist for industrial tax transfers between autonomous municipalities, very few have been arranged. It is recommended that the provincial government take a stronger role in encouraging both rural and urban municipalities to develop mutually acceptable revenue sharing arrangements.

Finally, the last year has seen a significant recession in the entire petroleum and natural gas industry triggered by falling international prices for oil. The heavy oil and oil sands industry has seen wells shut-in, and projects either down-sized, delayed or cancelled. Nevertheless, both the industry and the communities remain optimistic about the eventual development of the resource. Over the last few years, the Advisory Committee has noted a dramatic improvement in communications between the industry and the communities. We encourage all parties to take advantage of this "breathing room" offered by slower development to maintain a high level of communication and to work together to find acceptable solutions to existing and potential problems.

Summary of Committee Meetings and Travel

September 30, 1985 — Edmonton
A regular business meeting, including reports from all members, was held in Edmonton. The contents of the second annual report were reviewed and approved and an agenda for the committee for the rest of the year was finalized. Key efforts in the upcoming year would be the sponsorship of workshops in the Cold Lake Deposit Area involving the industry, local municipalities and government and discussions with individual government departments on issues and concerns. R. L. Coulson assumed the position of executive director of the Advisory Committee.

October 28, 1985 — Edmonton
The regular business meeting included discussions with senior department representatives from Alberta Housing and Alberta Municipal Affairs on issues and concerns pertinent to their department's mandate. Plans for an industry/rural municipality information exchange workshop to be held in Elk Point were confirmed.

November 24 and 25, 1985 — Elk Point
Following an evening meeting in Edmonton on November 24, the Advisory Committee travelled to Elk Point to host a rural municipality/industry information exchange workshop covering the Cold Lake Oil Sands Area. This all-day workshop was highly successful, being attended by 75 individuals representing five rural municipalities, 14 companies and 10 government departments.

December 12, 1985 — Edmonton
The Advisory Committee devoted its regular meeting to analysing and evaluating the results of the Elk Point workshop. The decision was made to produce a summary report. Individual members also gave their reports on activities in their respective sectors.

February 3, 1986 — Edmonton
Individual discussions were held, as part of the regular business meeting, with senior departmental representatives from Alberta Transportation and Alberta Native Affairs. From this discussion, it was decided that the Advisory Committee would visit interested native and Metis communities in the Cold Lake Oil Sands Area to discuss the impact on their communities of heavy oil development. The need for a roads to resources program was discussed with officials from Alberta Transportation.

April 2, 1986 — Edmonton
The regularly scheduled business meeting of the Advisory Committee was held in Edmonton. The date and location for a second information exchange workshop in the Cold Lake Oil Sands Area, this one involving the towns and villages, was established.

May 21, 1986 — Edmonton
The Advisory Committee devoted its scheduled meeting to a discussion on transportation issues and on the effects the current international oil price slump is having on the heavy oil and oil sands industry.

July 22, 1986 — Edmonton
Mr. W. E. (Bill) Payne, MLA assumed the chairmanship of the Advisory Committee. Committee members briefed the new chairman on the status of the heavy oil and oil sands industry in the various communities and reviewed the activities of the Advisory Committee over the past two years. The Advisory Committee also met with the newly appointed Minister of Energy, Dr. Neil Webber.

August 20, 1986 — Bonnyville and area
Members visited the Kehewin and Cold Lake Reserves. Discussions were also held with the Metis Association of Alberta in Bonnyville.

September 17, 1986 — Grand Centre and area
Members visited the Fishing Lake and Elizabeth Metis Settlements. In the evening, the regular business meeting was held in Grand Centre.

September 18, 1986 — Grand Centre
The Advisory Committee hosted in Grand Centre the urban municipality/industry information exchange workshop covering the Cold Lake Oil Sands Area. This second all-day workshop was again successful with 70 people attending representing 10 municipalities, 14 companies and 11 government departments.